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CLAIMS

1. Equipment for measuring water vapour flux density from a surface which equipment comprises (i) a measurement chamber with a single opening at one end,
5 which opening is adapted to be placed against the test surface; (ii) an air agitating means positioned within the measurement chamber and (iii) a means to measure the water vapour density within the chamber.
2. Equipment as claimed in claim 1 in which the air agitating means within the
10 chamber is able to purge the chamber with ambient air before and/ or after each measurement.
3. Equipment as claimed in claims 1 and 2 in which the air agitation means within the measurement chamber is a mechanical device.
- 15 4. Equipment as claimed in claims 1 to 3 in which the air agitation means comprises a fan.
5. Equipment as claimed in claims 1 to 4 in which the motive power for the air
20 agitating means in the measurement chamber is supplied by electrical, pneumatic or other means, providing rotary, reciprocating or other motion to an agitator propeller or paddle.
6. Equipment as claimed in claims 1 to 5 in which the source of motive power is
25 situated either inside or outside the measurement chamber and, if the source of motive power is situated outside the measurement chamber, then it is coupled to an agitator inside the measurement chamber by means of a shaft, electromagnetic or other form of coupling.

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7. Equipment as claimed in claims 1 to 6 in which the means to measure the water vapour density within the chamber comprise sensors positioned within the chamber or outside it, which sensors are able to measure quantities from which the density of water vapour within the chamber can be calculated.

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8. Equipment as claimed in claims 1 to 7 in which the sensors comprise means to measure the relative humidity and, optionally the temperature within the chamber.

9. Equipment as claimed in claims 1 to 7 in which there are a plurality of sensors.

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10. Equipment as claimed in claims 1 to 6 in which the means to measure the vapour density within the chamber comprises a sensor based on measuring the absorption of infrared radiation of suitable wavelength by the vapour.

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11. Equipment as claimed in any one of the preceding claims equipped with sensors able to measure the density of a vapour other than water vapour, which sensor readings can be evaluated to measure the flux density of the said vapour.

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12. Equipment as claimed in any one of the preceding claims in which there are means whereby the start of the measurement can be triggered either manually by the operator, or automatically by means of additional sensors.

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13. Equipment as claimed in any one of the preceding claims in which the measurement chamber is incorporated in a hand-held wand or other convenient hand-held enclosure.

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14. A method for measuring vapour flux density from a surface which method comprises placing the open end of a measurement chamber with a single opening at one end against the surface, optionally agitating the air within the chamber and measuring changes of vapour flux density within the chamber.

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15. Method as claimed in claim 14 whereby the said measurement chamber is purged with ambient air before and/ or after each measurement by an agitation means incorporated within the chamber.

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16. Method as claimed in claims 14 to 15 whereby the said measurement chamber is equipped with sensors and the rate of rise of water vapour density within it determined, which rate of rise is used to calculate water vapour flux density and related quantities such as water vapour flux, TEWL, stomatal conductance etc.

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17. Method as claimed in claims 14 to 16 whereby the start of the measurement is triggered either manually by the operator, or automatically by means of additional sensors.

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18. Method as claimed in claims 14 to 17 in which the vapour flux of water vapour is measured.

19. Method as claimed in claims 14 to 16 in which the vapour flux of vapours other than water vapour is measured, and the appropriate sensors for the given vapour are used.

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20. Method as claimed in any one of claims 14 to 19 in which the vapour is mixed rapidly with the trapped air to produce a vapour-air mixture of near-uniform humidity and temperature.

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